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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/955,115	09/19/2001	Koji Mishima	2001_1323A	9616

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EXAMINER	
LEADER, WILLIAM T	

ART UNIT	PAPER NUMBER
1742	7

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/955,115	MISHIMA ET AL.	
	Examiner	Art Unit	
	William T. Leader	1742	

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *7-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Applicant's election of Group I, claims 1-6 in Paper No. 6 filed on April 9, 2003, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 7-23 are withdrawn from consideration.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Gomez et al (6,508,924) or Kuriyama et al (6,379,520).

4. The Kuriyama et al patent is directed to electroplating. Kuriyama et al teaches that electroplating is used frequently in semiconductor fabrication processes to form wiring or films on a substrate (column 1, lines 11-12). The plating apparatus includes a substrate 1-4 connected as a cathode and an anode 1-3 disposed facing the substrate (column 1, lines 19-25 and figure 1). Plating solution

is supplied to fill the space between the substrate and anode. Kuriyama discloses that during plating the concentration of the plating solution varies (column 5, lines 52-55). In response to these variations, additive solution 2-4 from a replenishing tank is supplied to maintain the composition and concentration of the plating solution at predetermined values (column 5, lines 55-60). The additive solution 2-4 is an organic additive solution comprising a mixture of a polymer (brightener), leveler, carrier, and HCl. The composition and concentration of the plating solution may be analyzed by analyzer 2-26. Based on the results of the analysis, additive solution is supplied to a regulator tank 2-1 (column 6, lines 49-54). Plating solution from the regulator tank is supplied to the plating space by pump 2-10 (column 5, lines 37-39).

5. The disclosure of Kuriyama et al is considered to meet the limitations of the instant claims. Claim 1 recites filling a plating liquid containing metal ions and an additive into a plating space and changing the concentration of the additive in the plating liquid during a plating process. As noted above, Kuriyama supplies plating solution to fill the space between the substrate and anode. By teaching that the additive concentration varies during plating, Kuriyama et al meets the limitation that the concentration of the additive is changed.

6. Claim 2 recites that the additive is intermittently supplied. As noted above Kuriyama et al discloses provision of pump 2-10 to supply plating solution to the

plating space. Claim 3 recites the addition of the additive to the plating space. Kuriyama et al disclose adding additive after analysis by analyzer 2-24. Claim 4 recites adjustment by removal of the additive in the plating liquid. The removal of additives occurs naturally as a result of consumption during plating. Claim 5 recites that the additive is a brightener and that the concentration of brightener is lower in the middle and later stages of the plating processes. The concentration of brightener would fall because of consumption. Claim 6 recites that the concentration of leveler at the middle and later stages of the plating process is higher than that at the initial stage. The concentration would be raised by the addition of leveler as taught by Kuriyama et al during plating.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gomez et al (6,508,924) combined with Kuriyama et al.

10. The Gomez et al patent is directed to the control of electroplating baths. Gomez discloses that electroplating baths contain a plurality of constituents includes organic additives such as brighteners and levelers (column 1, lines 47-48). As the deposition is carried out the concentration of the organic additives agents fluctuates because of oxidation at the anode, reduction at the anode and chemical degradation (column 1, lines 56-58; column 2, lines 34-39). It is known to provide periodic additions of fresh additives (column 1, lines 62-63). Gomez et al specifically teaches that control of additive concentration is particularly important in the electroplating of electronic devices such as wafers (column 2, lines 24-28).

11. Claim 1 differs from the process disclosed by Gomez et al by reciting that the anode is disposed closely to the substrate so as to face the substrate. Kuriyama et al is taken as above and shows anode 1-3 closely spaced from and facing the substrate 1-4. The prior art of record is indicative of the level of skill of one of

ordinary skill in the art. It would have been obvious to have utilized the convention configuration of placing an anode closely spaced from and facing a semiconductor wafer to be plated in the process disclosed by Gomez et al because such an orientation is shown by Kuriyama et al to be effective in plating wafers. Application of the references to dependent claims 2-6 is as above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 703-308-2530. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

William Leader
June 16, 2003

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700